

## **Project: Water Quality Monitoring on the Lower Sudbury River**

**Proponent:** Organization for the Assabet River

**Overview:** The Organization for the Assabet River (OAR) is initiating a baseline water quality monitoring program for the lower Sudbury River (from Saxonville, Framingham, to the confluence of the Sudbury with the Assabet at Egg Rock in Concord). This project is partially funded by a grant from the Sudbury, Assabet, and Concord River Wild and Scenic River Stewardship Council. The project scope has been developed with technical guidance from Massachusetts Department of Environmental Protection (DEP) staff and is presented here. A full project budget and a sub-project budget for the costs of monitoring sites of potential interest to the town of Wayland are presented in Appendix A. Town of Wayland's participation in this project would allow OAR to strengthen the monitoring effort and include extend sampling to the full growing season (adding May and September sampling).

### **Background:**

A. The Organization for the Assabet River (OAR):

Established in 1986 to preserve, protect and enhance the Assabet River, its tributaries and watershed, the Organization for the Assabet River serves the residents of the 26 municipalities of the Assabet and Concord River watershed. In the past OAR's focus has been the Assabet River, but today OAR's water quality monitoring and river cleanup programs extend downstream through the Concord River watershed. To understand and advocate fully for the health of these rivers, it is necessary to understand the condition of the whole Sudbury, Assabet, and Concord River system. OAR has close to 1000 individual, family and corporate members, and some 230 active volunteers. A recognized leader for its success in reducing effluent pollution, OAR uses science-based advocacy to implement its mission with three program areas: Water Quality and Stewardship; Policy and Advocacy; and Outreach and Education. OAR's well-established water quality and streamflow monitoring program has been providing water quality data on the Assabet since 1992 (under an approved Quality Assurance Program Plan since 2000) and provides essential information for local, state and federal decision-makers to protect water resources.

B. The Sudbury River:

The Sudbury River, part of the federally-designated Sudbury, Assabet, and Concord Wild and Scenic River system, flows for 32 miles from its headwaters in Cedar Swamp, Westborough, to its confluence with Assabet River in Concord, forming the Concord River. All segments of the Sudbury are listed as "Class B, Warm Water Fishery." In addition, the segment from the outlet of Cedar Swamp Pond to the Fruit Street Bridge in Hopkinton, is listed as an Outstanding Resource Water (ORW) and is within the Cedar Swamp Area of Critical Environmental Concern (ACEC). The Sudbury drains a watershed area of about 162 square miles, 29 of which drain into MDC reservoirs. The average slope of the Sudbury is a relatively gentle 4.8 feet/mile from an elevation of 265 feet in Westborough to 112 feet in Concord. The Sudbury is impounded in seven locations in the upper reaches of the river in Westborough, Southborough, Ashland, and Framingham. About four miles downstream of the Myrtle Street impoundment in Ashland, there is a series of four relatively large reservoirs, which make up the Sudbury Reservoir system. These reservoirs are part of the Massachusetts Water Resources Authority's (MWRA) backup water-supply system. Two of the four reservoirs are on the mainstem Sudbury (Framingham

Reservoirs #1 and #2, aka Stearns and Bracket Reservoirs). Reservoir #3 (aka Foss Reservoir) and the Sudbury Reservoir, fed by a number of small tributaries including North Branch, Mowry, and Angelica Brooks, join the Sudbury at the downstream end of Reservoir #1 in Framingham. The Saxonville dam in Framingham forms the downstream-most impoundment of the Sudbury River and the upper boundary of the 14.9-mile Wild and Scenic section of the river. Much of the lower section of the Sudbury River is protected by the Great Meadows National Wildlife Refuge, extending about six miles through Wayland and Sudbury. The broad marshes of this section provide significant habitat for aquatic and terrestrial wildlife and natural flood-water storage.

#### C. Issues:

The Sudbury River is a natural, historic, and recreational asset to the region, but it also suffers nutrient, bacterial, and mercury contamination. All sections of the Sudbury River below Fruit Street in Hopkinton are listed on the state's "Integrated List of Waters" as "Category 5: Requiring a TMDL" for metals. The lower section is also listed for exotic species (water chestnut). Hop Brook, and the series of ponds formed by the brook, are listed as Category 5 for nutrients, pH, organic enrichment, low DO, suspended solids, and noxious aquatic plants. (Appendix A shows listings by segment.)

Known major sources of impairment to the watershed include: Nyanza superfund cleanup site in Ashland (mercury), the Natick Laboratory Army Research Center superfund site in Natick (VOCs and metals), the Wayland wastewater treatment plant (nutrients), and the Marlborough Easterly wastewater treatment plant (nutrients) that discharges to Hop Brook, the largest of the tributaries to the Sudbury River. By 2013, upgrades at the Marlborough Easterly wastewater treatment plant are expected to reduce effluent phosphorus concentrations from the current interim limit of 0.50 mg/L to 0.10 mg/L; this should lead to significant improvements in the Hop Brook system. Potential sources of pollution include non-point source runoff from urbanized areas (particularly the heavily urbanized areas of the upper watershed in Westborough, Ashland, and Framingham), and from sub-standard septic systems. Much of the watershed relies on local septic systems for wastewater treatment. Finally, there are over 100 waste cleanup sites (21E sites) listed by the Department of Environmental Protection within the Sudbury watershed, some of which may pose contamination threats to the river.

#### D. Previous Studies:

Over the last 10 years there have been a number of sampling projects on the Sudbury, although no ongoing annual sampling. In 2001, as part of their five-year rotating basin plan, MA DEP conducted water quality sampling throughout the SuAsCo watershed including bacterial and nutrient sampling at 21 locations on the Sudbury and its tributaries. MA DEP conducted sampling again in 2006 (results of this survey are pending) and anticipates monitoring in the basin in the summer of 2010. As part of the NAWQA program, USGS collected water quality samples at one location (in Ashland) in April and August of 2000. The Hop Brook, the largest of the tributaries of the Sudbury, has been more extensively studied, including an intensive nutrient study in 2000, which found nutrient concentrations approximately ten times higher than levels necessary to result in eutrophication of the brook. MA DEP's SMART Monitoring Program tests water quality at one station on the Sudbury (at the USGS Saxonville gage off Danforth Street, Framingham) every month; data from this program is being reviewed for quality by DEP.

Finally, continuous streamflow data for the Sudbury River is available from the USGS gage at Saxonville (Framingham).

In 2002/2003 ENSR International, under contract to the MA DEP and the U.S. Army Corps of Engineers, conducted a thorough nutrient and bacterial survey of the Sudbury basin. Sampling was conducted at 62 locations, including 28 mainstem and 34 tributary locations. Bacterial samples exceeded the state standards for fecal coliforms at various locations and times, particularly in the tributaries in wet weather, but showed a complex pattern suggesting that there are likely multiple sources of bacterial contamination. Nutrient levels were generally moderate, with higher concentrations at a few sites: total phosphorus concentrations ranged from <0.01 to 0.22 mg/L; nitrate nitrogen concentrations ranged from <0.01 to 10.2 mg/L and tended to be higher in the tributaries than in the mainstem; dissolved oxygen levels were generally within acceptable ranges except at all sampling locations in the Sudbury mainstem downstream of Stonebridge Road in August 2003 when DO ranged from 3.07 – 4.78 mg/L.

E. Suggested monitoring strategies:

The review of these studies suggests that several types of monitoring may be useful on the lower Sudbury and its tributaries: long-term nutrient monitoring designed to track changes over time, bacterial and non-point source pollution tracking surveys designed to identify sources of impairment, and aquatic plant monitoring designed to track invasive plant populations over time. After consultation with the Massachusetts Department of Environmental Protection and the Sudbury, Assabet and Concord Wild and Scenic River Stewardship Council, OAR will implement the first piece of an overall monitoring strategy: a baseline water quality monitoring program on the lower Sudbury River. Long-term monitoring is critical to gauging the effect of any changes in management, such as the reduction in nutrients from the wastewater treatment plants or increases in non-point source pollution with increasing development.

**Project:**

With this project OAR seeks to establish a baseline water quality monitoring program focused on nutrients in the lower Sudbury River and its major tributary, Hop Brook. A baseline monitoring program is designed to measure set parameters at a number of fixed monitoring stations multiple times during the year. OAR will incorporate Sudbury watershed sampling into OAR's ongoing volunteer-based monitoring program. Engaging volunteers in the sampling program will provide a hands-on opportunity for watershed residents to learn more about the Sudbury and become better stewards of the river. Where possible, OAR will collaborate with existing lake and stream groups to guide the development of the monitoring program and recruit volunteers. Results of the first year of sampling will help assess the condition of the Sudbury River and guide the development of future surveys. This project is designed to be an ongoing program (funding dependent).

Project oversight:

The Organization for the Assabet River's Staff Scientist, Sue Flint, will be responsible for all project activities (see Table 2: Tasks) including: developing a Quality Assurance Program Plan (QAPP) approved by the Massachusetts Department of Environmental Protection (with input and comments from EPA Region 1's Quality Assurance Officer); providing a detailed sampling

manual with site directions and sampling methods; recruiting, training, and scheduling volunteers; maintaining sampling equipment; calibrating water quality meters before and after each field use; overseeing all field activities; entering field and quality control data in the OAR water quality database; making provisional data available on OAR's webpage; and reporting final (QC'ed) data to interested parties. Ms. Flint's work will be overseen by OAR's Acting Executive Director, Alison Field-Juma. Data will be checked for quality (as specified in OAR's existing QAPP) by Cindy Delpapa of the Massachusetts Riverways Program. Data that does not meet stated data quality objectives will be flagged as questionable or censored in the final report. Technical guidance will be provided by DEP staff including Paul Hogan and Warren Kimball.

Parameters:

Parameters related to eutrophication from anthropogenic sources will be monitored including: chlorophyll *a*, total and ortho-phosphorus, nitrates, ammonia, total suspended solids, pH, water temperature, conductivity, and dissolved oxygen. Nutrients (phosphorus and nitrogen/ammonia) are useful in assessing point and non-point source inputs. Total suspended solids are useful in assessing non-point source inputs, especially during rain events. Chlorophyll *a*, pH, and dissolved oxygen help indicate the effects of excess nutrient pollution (eutrophication).

**Table 1: Parameters**

<b><i>Laboratory analyses</i></b>	
Chlorophyll <i>a</i>	Assess the effects of nutrient inputs
Total and ortho-phosphorus	Assess point and non-point nutrient inputs
Nitrates	Assess point and non-point nutrient inputs
Ammonia	Assess point and non-point nutrient inputs
Total suspended solids	Assess non-point nutrient inputs
<b><i>In-situ measurements</i></b>	
pH	Assess the effects of nutrient inputs
Dissolved oxygen	Assess the effects of nutrient inputs
Water temperature	Assess habitat conditions for fish
Conductivity	General indicator of pollution (monitored with DO/temp)

Monitoring will be conducted between approximately 5:30 a.m. and 8:30 a.m. on each sampling date to ensure that low morning dissolved oxygen concentrations are adequately captured. Streamflow information will be collected from USGS's gage at Saxonville; streamflows at ungaged mainstem sites can be calculated as a function of the flow at the Saxonville gage and the size of the contributing area relative to the gage's contributing basin. Rainfall data for each sampling day and the five days preceding the sampling date will be collected from the National Weather Services' web site for the two nearest full weather stations (Bedford, MA, and Worcester, MA); this information will be used to assess whether samples are collected during a "wet" or "dry" period.

Results can be compared with state water quality standards (WQSs) and with EPA Ecoregion recommendations (for nutrients where the state WQSs are narrative). A water quality index can

be calculated to estimate overall water quality at each site using OAR's Water Quality Index (<http://www.assabetriver.org/projects/wq-monitoring/interpre-data/stream-health-index>).

#### Sampling Sites:

Six sites (Table 2; five Sudbury River mainstem and one tributary site) will be sampled once a month during the summer growing season (May, June, July, August, and September) and one gaged site (Danforth Street, Framingham) will be sampled during the non-growing season (once a month in October, February, and April). Sites were selected with consideration of: good distribution of sites along the lower river, adequate parking, and safe, public river access for volunteers. Hop Brook at Landham Road is included in the monitoring to assess the inputs from Hop Brook which is the largest tributary to the Sudbury River and receives the wastewater discharge from the Marlborough Easterly municipal wastewater treatment plant near its headwaters.

**Table 2: Sampling Sites**

Site Description	Town
Rte 62 South Bridge Boat House	Concord
<b>Sherman Bridge Road</b>	<b>Sudbury/Wayland</b>
<b>River Rd. (downstream of Wayland WWTP discharge)</b>	<b>Wayland</b>
<b>Pelham Island Road (upstream of Wayland WWTP discharge)</b>	<b>Wayland</b>
Danforth Street (USGS gage site)	Framingham
<b>Hop Brook at Landham Road</b>	<b>Sudbury</b>

**Table 3: Project Deliverables and Schedule for 2009/2010**

Task	July 09	Aug 09	Sept 09	Oct 09	Nov 09	Dec 09	Jan 10	Feb 10	Mar 10	Apr 10	May 10	June 10
Quality Assurance Program Plan approved	X											
Sampling manual updated		X										
Volunteers recruited and trained		X										
Full summer sampling (6 sites) conducted (May, June, July, Aug, Sept from 2010 onwards)		X	X									X
Winter sampling (one site only)				X				X		X		
Sudbury sites added to OAR's water quality database; field and quality control data entered in database			X									
Preliminary data published to OAR's webpage			X	X				X		X		X
Data reviewed by QC Officer										X		
Sudbury data published and distributed with OAR's annual Water Quality Data Report											X	

**Project budget:** A full project budget and a sub-budget for Wayland sites are presented in Appendix A.



### **Personnel qualifications:**

The Water Quality and Stewardship program is managed by the Organization for the Assabet River's staff scientist, Suzanne Flint. Ms. Flint holds a Master of Science in Environmental Science and has worked for the Organization for nine years overseeing the volunteer-based water quality and streamflow monitoring program. Ms. Flint reports directly to OAR's Acting Executive Director, Alison Field-Juma. Ms. Juma holds a Master's degree in Watershed Management. The contract laboratory used for water quality analysis, Nashoba Analytical LLC, is a state-certified laboratory. A separate laboratory will be used for the analysis of chlorophyll a.

### **Overview of similar services:**

OAR has a strong track record of collecting and reporting reliable water quality and streamflow data. Started in 1992, OAR's water quality monitoring program has collected data under an EPA- and state-approved QAPP since 2000 ("Quality Assurance Project Plan for the Volunteer Water Monitoring Program." OAR. Approved April 2000 and extended 2007). Developed as part of "StreamWatch" project, tributary site sampling and streamflow measurements are documented in a second QAPP approved in 2003 ("Quality Assurance Program Plan for the StreamWatch Project." OAR. Approved June 2003) and extended in 2007. The StreamWatch project, funded by an EPA EMPACT-Metro grant, was collaboration between OAR, the Town of Hudson (for the Assabet River Consortium), USGS, and Mass Audubon. As a partner in the StreamWatch project, OAR was responsible for the water quality and streamflow monitoring, development of a "Stream Health Index" to evaluate the data, and making the data available to the public in near-real time. Over its 15 years, OAR's water quality and streamflow monitoring program has been supported by a variety of grants and by ongoing support from towns and OAR members. The program currently includes about 30 volunteers annually, who conduct monthly sampling at 24 sites in twelve towns. OAR's involvement with other water quality monitoring groups in the watershed has included sponsoring a biennial roundtable for groups in the SuAsCo, providing technical support for Friends of White Pond and Westford Watersheds, and providing advice on advocacy surrounding Water Management Act permits.

### **References: for water quality monitoring**

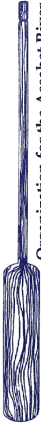
Warren Kimball, Environmental Engineer  
DEP Central Region, 627 Main Street  
Worcester, MA 01608  
Tel. 508-767-2879

### **Literature Cited:**

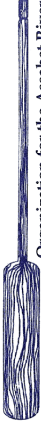
<http://www.mass.gov/dep/cleanup/index.htm> Department of Environmental Protection's Hazardous Waste Cleanup Sites list; accessed 5/27/09

MA DEP, 2005. SuAsCo Watershed 2001 Water Quality Assessment Report. Report Number 82-AC-1. DWM Control Number CN92.0. August 2005.

ENSR 2004. Sudbury River Water Quality Study 2002 – 2003 Final Report. Document Number 09090-025-105. April 2000.



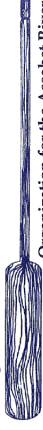
Lower Sudbury Sampling - First Year Full Project Costs					
Analyte (Nashoba Analytical Quote)	Price per sample	Samples/Month (Sites + QC)	Months sampling (May - Sept)	Total Annual Samples	Annual cost/analyte
<b>Summer sampling</b>					
Chlorophyll a (Alpha Analytical)	\$52.00	8	5	40	\$2,080
Total phosphorus	\$21.00	8	5	40	\$840
ortho-phosphorus	\$15.00	8	5	40	\$600
nitrate-N	\$15.00	8	5	40	\$600
ammonia-N	\$15.00	8	5	40	\$600
Total suspended solids	\$14.00	8	5	40	\$560
Summer sampling subtotal					\$5,280
<b>Winter Sampling</b>					
Chlorophyll a (Alpha Analytical)	\$52.00	0	3	0	\$0
Total phosphorus	\$21.00	3	3	9	\$189
ortho-phosphorus	\$15.00	3	3	9	\$135
nitrate-N	\$15.00	3	3	9	\$135
ammonia-N	\$15.00	3	3	9	\$135
Total suspended solids	\$14.00	3	3	9	\$126
Winter sampling subtotal					\$720
Total annual analysis costs					<b>\$6,000</b>
<b>Meter Purchase and Costs (YSI multiparameter meter):</b>					
Meter purchase (one time purchase)					\$6,500
Calibration solution (annual)					\$100
Instrument maintenance (annual)					\$300
Total equipment costs					\$6,900
<b>Staffing Costs</b>					
Staff Scientist first summer				Hours/Week	
Staff Scientist first winter				10	\$3,750
Contract (database update)				5	\$6,250
Other project staff				2	\$1,200
Total staffing costs					\$750
Total staffing costs					\$11,950
<b>First Year Project Total</b>					<b>\$24,850</b>
<b>Lower Sudbury Sampling: Project Costs Years 2 - 5</b>					
Total annual analysis costs (same as Yr 1)					\$6,000
Calibration solutions and instrument maintenance					\$400
Staff Scientist summer					\$1,875
Staff Scientist winter					\$1,250
Other staff					\$375
<b>Project Total (Years 2 - 5)</b>					<b>\$9,900</b>



Lower Sudbury Sampling - First Year WAYLAND SITES ONLY Project Costs					
Analyte (Nashoba Analytical Quote)	Price per sample	Samples/Month (Sites + QC)	Monthly sampling (May - Sept)	Total Annual Samples	Annual cost/analyte
<b>Summer sampling</b>					
Chlorophyll a (Alpha Analytical)	\$52.00	5	5	25	\$1,300
Total phosphorus	\$21.00	5	5	25	\$525
ortho-phosphorus	\$15.00	5	5	25	\$375
nitrate-N	\$15.00	5	5	25	\$375
ammonia-N	\$15.00	5	5	25	\$375
Total suspended solids	\$14.00	5	5	25	\$350
Summer sampling subtotal					<b>\$3,300</b>
<b>Winter Sampling</b>					
Chlorophyll a (Alpha Analytical)	\$52.00	0	(Oct, Feb, April) 3	0	\$0
Total phosphorus	\$21.00	0	3	0	\$0
ortho-phosphorus	\$15.00	0	3	0	\$0
nitrate-N	\$15.00	0	3	0	\$0
ammonia-N	\$15.00	0	3	0	\$0
Total suspended solids	\$14.00	0	3	0	\$0
Winter sampling subtotal					\$0
Total annual analysis costs					<b>\$3,300</b>
<b>Meter Purchase and Costs (YSI multiparameter meter):</b>					
Meter purchase (one time purchase)					\$6,500
Calibration solution (annual)					\$50
Instrument maintenance (annual)					\$150
Total equipment costs					\$6,700
<b>Staffing Costs</b>					
Staff Scientist first summer				Hours/Week	
Staff Scientist first winter				1	\$375
Total staffing costs				0.5	\$625
					\$1,000
<b>First Year Project Total</b>					<b>\$11,000</b>

Lower Sudbury Sampling: Project Costs Years 2 - 5	
Total annual analysis costs (same as Yr 1)	\$3,300
Equipment costs	\$200
Staff Scientist summer	\$375
Staff Scientist winter	\$625
<b>Project Total (Years 2 - 5)</b>	<b>\$4,500</b>





## Appendix B: Sudbury watershed sections listings from Final Massachusetts Year 2008 Integrated List of Waters CN 281.1

NAME and SEGMENT ID	DESCRIPTION	SIZE	IMPAIRMENT CAUSE APPROV. Approval Date/ Document #
<b>Category 3: No uses assessed</b>			
Sudbury River (8247650) MA82A-01_2008	From the source at the outlet of Cedar Swamp Pond, Westborough to the Fruit Street Bridge, Hopkinton/Westborough	1.9 miles	
<b>Category 4a: TMDL Completed:</b>			
Sudbury Reservoir (82106) MA82106_2008	Southborough/Marlborough	1178 acres	Metals 12/20/2007-NEHgTMDL
<b>Category 4b: Impairment not caused by a pollutant:</b>			
Framingham Reservoir #3 (82046) MA82046_2008	Framingham	221 acres	(Exotic species*)
<b>Category 5: Requiring a TMDL</b>			
Carding Mill Pond (82015) MA82015_2008	Sudbury	40.5 acres	Nutrients Noxious aquatic plants (Exotic species*)
Eames Brook (8248125) MA82A-13_2008	From the outlet of Farm Pond, Framingham to the confluence with the Sudbury River, Framingham.	0.57 miles	-Cause Unknown -Taste, odor and color -Noxious aquatic plants -(Exotic species*) -(Objectable deposits*)
Framingham Reservoir #1 (82044) MA82044_2008	Framingham	118 acres	-Metals -(Exotic species*)
Framingham Reservoir #2 (82045) MA82045_2008	Framingham/Ashland	114 acres	-Metals -Turbidity
Grist Mill Pond (82055) MA82055_2008	Sudbury/Marlborough	16.7 acres	-Nutrients -Organic enrichment/Low DO -Pathogens -Noxious aquatic plants -(Exotic species*)
Framingham Reservoir #1 (82044) MA82044_2008	Framingham	118 acres	-Metals -(Exotic species*)
Framingham Reservoir #2 (82045) MA82045_2008	Framingham/Ashland	114 acres	-Metals -Turbidity
Grist Mill Pond (82055) MA82055_2008	Sudbury/Marlborough	16.7 acres	-Nutrients -Organic enrichment/Low DO -Pathogens -Noxious aquatic plants -(Exotic species*)
Hop Brook (8247825) MA82A-05_2008	Outlet of Carding Mill Pond, Sudbury to confluence with Allowance Brook, Sudbury (Allowance Brook was identified as Landham Brook on USGS quads prior to 1987).	6.7 miles	-Nutrients -Organic enrichment/Low DO -Noxious aquatic plants -(Exotic species*)



Hop Brook (8247825) MA82A-06_2008	From the confluence of Allowance Brook, Sudbury to the confluence with the Sudbury River, Wayland (formerly identified as Wash Brook, Hop Brook appeared as Wash Brook and Allowance Brook was identified as Landham Brook on USGS quads prior to 1987).	3.0 miles	-Nutrients -Pathogens -Noxious aquatic plants
Pantry Brook (8247700) MA82A-19_2008	From source west of Haynes Road, Sudbury to the confluence with the Sudbury River, Sudbury	3.2 miles	-Pathogens
Pine Brook (8247950) MA82A-14_2008	From source south of Route 20, just east of the Weston/Wayland border to the confluence with the Sudbury River, Wayland.	2.5 miles	-Cause Unknown
Stearns Mill Pond (82104) MA82104_2008	Sudbury	19.1 acres	-Nutrients -Organic enrichment/Low DO -Noxious aquatic plants -Turbidity -(Exotic species*)
Sudbury River (8247650) MA82A-03_2008	Outlet Saxonville Pond, Framingham to confluence with Hop Brook (the lower portion of Hop Brook was identified as Wash Brook on USGS quads prior to 1987), Wayland.	5.5 miles	-Metals
Sudbury River (8247650) MA82A-04_2008	Confluence with Hop Brook (the lower portion of Hop Brook was identified as Wash Brook on USGS quads prior to 1987), Wayland to confluence with Assabet River, Concord.	11.7 miles	-Metals -(Exotic species*)
Sudbury River (8247650) MA82A-25_2008	From the Fruit Street bridge Hopkinton/Westborough to the inlet of Framingham Reservoir #2, Ashland (formerly part of segment MA82A-02).	6.3 miles	-Metals
Sudbury River (8247650) MA82A-26_2008	From the outlet of Framingham Reservoir #1, Framingham to the inlet of Saxonville Pond, Framingham (formerly part of segment MA82A-02).	2.8 miles	-Cause Unknown
Unnamed Tributary(8247880) MA82A-17_2008	From the outlet of Grist Mill Pond, Sudbury to the inlet of Carding Mill Pond, Sudbury.	0.52 miles	-Nutrients -Organic enrichment/Low DO -Suspended solids -Noxious aquatic plants
Unnamed Tributary (8247885) MA82A-16_2008	From the outlet of Hager Pond, Marlborough to the inlet of Grist Mill Pond, Marlborough.	0.17 miles	-Nutrients -pH -Organic enrichment/Low DO -Suspended solids -Noxious aquatic plants
Unnamed Tributary (8247890) MA82A-15_2008	From the source northeast of Indian Head Hill (near Route 20), Marlborough to the inlet of Hager Pond, Marlborough.	1.1 miles	-Nutrients -Organic enrichment/Low DO -Suspended solids -Noxious aquatic plants
Unnamed Tributary (8248010) MA82A-22_2008	Unnamed tributary to the Sudbury River locally known as Cochrutuate Brook, from the outlet of the north basin of Lake Cochrutuate, Framingham to confluence with Sudbury River, Framingham.	1.4 miles	-Cause Unknown